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OPERATION OF ROOT APEX RESECTION – MODERN RISK FACTORS AND COMPLICATIONS

ОПЕРАЦІЯ РЕЗЕКЦІЇ ВЕРХІВКИ КОРЕНЯ – СУЧАСНІ ФАКТОРИ РИЗИКУ ТА УСКЛАДНЕННЯ

Анотація. При операції резекції верхівки кореня зуба виникає травматичне ушкодження тканин, яке призводить до відповідної реакції організму місцевого та загального характеру. При виборі операційного доступу необхідно враховувати топографію кісткових структур, адекватне кровопостачання слизово-окісного клаптя, створювати достатній огляд операційного поля. Виділяють 3 основних типа горизонтальних розрізів:

внутрішньоборoздковий, парамаргінальний та розріз в ділянці рухомої слизової оболонки. В окрему групу виділяють вертикальний розріз. Таким чином, при операції резекції верхівки кореня вагоме значення надається виду операційного доступу та способу ушивання країв рани.

Ключові слова: резекція верхівки кореня, операційний доступ, ускладнення, ушивання операційної рани.

Summary: Operation resection of the root apex occur traumatic damage of tissue, which inevitably leads to the general and local reaction of the organism. It should be taken into account the topography of the surrounding bony structures during choosing of the access, remember to carve out an adequate blood supply to the flap, to create a good overview of the surgical field. There are 3 main types of horizontal sections: intra-sulcular, paramarginal and incision in the mobile mucosa. The vertical incision is allocated to separate group. So, the type of incision and method of suturing the surgical wound is critical at operation resection of the root apex.

Keywords: resection of root apex, operative approach, complications, operative wound suturing.

The relevance of problem. Operation resection of the root apex occur traumatic damage of tissue, which inevitably leads to the general and local reaction of the organism. Every organism is individual, so it is impossible to predict certainly the exact result of the planned treatment.

The aim of the research. The response, especially in the presence of comorbidity, or due to wrong planning of the operation can quite quickly lead to complications. Some basic principles can help to prevent complications.

Materials and methods. It was used analytical methods for the analysis of the research literature total of 87.

Research results and its discussion. Medical anamnesis reveals the risk factors, the presence of comorbidity. Among the common diseases represent a certain risk of the following diseases: hypertension, asthma, diabetes, allergies to

medications, etc. [5, 15]. In addition, important is the age of the patient, presence of harmful habits, oral hygiene indicators.

The risk associated with conducting of operations resection of root apex, firstly, associated with soft tissue incision and mechanical action on the bone tissue of the jaw. For a favorable course of wound healing doctor should create conditions for primary wound intention. Secondly, the risk is associated with supportive care (antibiotics, anti-postoperative edema, maintaining proper oral hygiene).

Analysis of post-operative state (temperature reaction, the blood reaction, swelling, pain) helps to decide on the need for re-intervention or changes in maintenance therapy.

Operation resection of root apex is positioned by many doctors as a standard surgical procedure that is performed by an oral surgeon almost daily. However, this operation is fraught with many dangers.

There are following risk factors during preparation for the operation (for example, when choosing an anesthetic), as hypertension and asthma may cause somatic complications (hypertensive crisis, collapse, bronchial asthma attack) if doctor use anesthesia with epinephrine [4]. Epinephrine and vasoconstrictors other even in small doses have local and systemic influence, so they can be used carefully, especially in patients with concomitant diseases. One standard that could be applied to all patients does not exist. The amount of anesthetic solution and a vasoconstrictor for each patient should be individualized. Contraindications to the use of vasoconstrictors are decompensated form of cardiovascular disease, endocrine disorders, using of antidepressants, thyroid hormones, agents that block beta-adrenergic receptors.

The doctor has a difficult problem during conducting a local anesthesia for risk patients: how to achieve effective anesthesia and avoid complications. The feeling of fear and pain after ineffective pain relief in patients with cardiovascular disease, diabetes, and asthma causes an increase in the number of endogenous catecholamines (adrenaline and so forth) in the blood, which leads to the somatic complications such as angina pectoris, myocardial infarction, diabetic metabolic disorders substances. It

should be noted that the dose of a vasoconstrictor that is introduced by patient arriving at the local anesthetic with epinephrine, much less than the amount of endogenous catecholamines in emotional arousal. Therefore it is necessary to use anesthetic solution with a low concentration of a vasoconstrictor - 1: 200000. The best results are obtained by using an anesthetic on the basis of 4% articaine with epinephrine 1: 200 000 (Ultracain DS, Ubistesin et al.). For anesthesia is desirable to use the minimum dose - 0.5-1 ml - solution of anesthetic, the optimal dose average - from 2.5 to 2.8 ml of the anesthetic (1-2 the cartridges) [3].

In addition, low level of vasoconstrictor has positive effect on the formation of a blood clot in the jaw bone wound.

The features of the postoperative management of patients after surgery it is describes in a review article R.H. Haug et al. (2009) listed the following recommendations: the injection of glucocorticoid medication (dexamethasone 4 mg) in the operating region of the wound and the minimum size of the flap to prevent edema in the postoperative period. The need for systemic antibiotics is not statistically significant. Concomitant pathology, traumatic manipulations and the duration of the operation, the need for an osteotomy have the significance (not statistically significant) in the postoperative period [12].

After operation resection of root apex the infection may spread to nearby cellular areas [11].

Most cases of spread of infection occur against of already existing inflammation (exacerbation of chronic periodontitis, severe periodontitis). Anticipating the further spread of infection is not always possible. Unfortunately, there is no recognizable type of formation of flap, which would be a minimally invasive and, at the same time, with the lowest percentage of complications.

However, the type of incision and method of suturing the surgical wound is critical at operation resection of the root apex.

A clear understanding of the causal relationships between technique of incision and postoperative period over to avoid complications such as long-term post-operative pain, swelling of subsided papilla and scarry tissue changes [1, 19].

It should be taken into account the topography of the surrounding bony structures during choosing of the access, remember to carve out an adequate blood supply to the flap, to create a good overview of the surgical field [6]. It should be also pay attention to the condition of periodontal tissue, biotype of tissues [7].

There are 3 main types of horizontal sections: intra-sulcular, paramarginal and incision in the mobile mucosa. In addition, it is appropriate to allocate a separate group of vertical cross-section, because the accuracy of its implementation depends on the healing time and the amount of loss of interdental papilla.

Intra-sulcular incision is a classic access to the periapical tissues [10]. The indications for its using are the zone of keratinized attached gingiva at least 3 mm, thin biotype of gums, proximity mental foramen.

Among the advantages can be noted a good view of the surgical field by combining of intra-sulcular incision with a vertical, thus forming a triangular or trapezoidal flap; rapid healing due to an adequate blood supply to the flap, the absence of scarring. The disadvantages of the incision are the appearance of gingival recession and declining gingival papillae. L. Jansson et al. (1997) examined the state of periodontal tissues in intra-sulcular incision after resection of the apex in 59 patients [13]. Loss of attachment was 0.26 mm at 1 year after surgery ($p < 0,05$). The mean attachment loss of value in the resected teeth was 0.85 mm ($p = 0,04$). Also it was noted that the distance from the point of contact of the teeth to the interdental septum was 5 mm or less after intervention papilla stored in 100% of cases, at 6 mm - 56%, more than 7 mm, and - 25%.

Subspecies of intra-sulcular incision is combined incision with preservation of gingival papillae - parapapillar. Modification of intra-sulcular incision was proposed by P. Cortellini in 1995 [9]. Conduct section includes 2 stages - dissection of the epithelial lining of the depth of 0.5-1 mm and subepithelial incision toward the bone, thus creating a split flap at the site. The incision extends laterally interdental spaces. The direction of the scalpel to the base of the papilla perpendicular to line drawn from the tip of the papilla to its base at a tangent to the tooth.

For the paramarginal section it requires a fairly wide zone of keratinized attached gingiva, at least 3 mm.

The incision follows the shape of the gingival contour, some distance from the gingival margin 3-5mm. Performing of paramarginal incision on the muco-gingival border leads to prolonged bleeding during surgery and prolong the healing. Paramarginal incision during surgery resection of the root apex is performed only in the presence of attached gingiva than 3 mm and involvement in space of cestgranuloma of causal root of the tooth is not more than 25%, which is determined on the radiograph.

The incision in mobile mucosa is usually done at surgery for radicular cysts of the jaws. In most cases, it is carried out when there is a lack of keratinized attached gingiva area and can not be used intra-sulcular or paramarginal incision, because inevitable occurrence of gingival recession or exposed edges of the prosthetic at their presence in the area of anterior teeth [14].

Vertical incisions are carried out in order to increase the mobility of the flap, access and viewing of the surgical field. The lack of vertical sections may lead to excessive tension or rupture of the flap when it is peeled. [20] Therefore, before the closure of the surgical wound, in the absence of free overlap the wound flap (by pulling the forceps) requires its mobilization. Vertical incision line in any case should not fall on the area of the bone defect.

During forming of the flap with vertical sections, it should be noted that the base of the flap should be slightly wider than the free edge. Technique of the vertical section has a number of features - section must be held vertically and if possible not go beyond 2-3 mm in muco-gingival border to prevent swelling and bruising. K. Selvig and M. Torabinejad (1996) have studied the healing time after intra-sulcular incision with a vertical slit that went to the mobile mucosa [17]. Histologically, the intervention of the epithelial attachment recovery occurred in the attached and keratinized gingiva after 2 weeks, in the movable mucosa only after 4 weeks. During the formation of unacceptable vertical section a pointed edge of flap or dissection

papilla, as this may lead to necrosis and, as a consequence, to reduce the height of interdental papilla.

Sutures that are used to alveolar process, are different from the traditional (used in general surgery) becouse they must not only compare the edges of the wound, but also to create a snug fit of the mucosa and the periosteum to the bone. To perform this task, in addition to the appropriate surgical technique should first prepare the contact surfaces (mucosa, tooth root cement, jaw bone) [8, 16, 18].

Seams on the alveolar process are divided into two groups - single and continuous. In most cases, it is necessary to use single sutures. Continuous sutures are easy to impose, require cost less time, but they hold the wound edges and around the graft difficult.

Avetikov DS et al. (2015) find that successful wound healing of muco-periosteal flap comes at its bonding composition "Sulfacrylate". At the stage of the regenerative process (7 days after surgery) it is manifested accelerated formation of connective tissue scar, as evidenced by the rapid change of the cells of the monocyte-macrophage series on fibroblasts; this is confirmed by the morphometric studies [2].

Thus, during the operation resection of root apex (in addition to the usefulness of the actual operation and retrograde filling) the mean result is given to the surgical approach and the method of suturing the wound edges.

In conclusion it is necessary to cause adverse reactions of typical postoperative surgery resection of the apex.

Bleeding. Small bleeding, blood in the saliva is normal after the operation. To prevent bleeding advised to avoid excitement and exercise.

Edema. Post-operative edema is a common reaction to the surgery. Edema is usually increased to 2-3 days, reaching at this point its maximum.

Hematoma. In some cases, post-operative swelling is accompanied by discoloration of the skin (black, blue, green, yellow). Generally, this phenomenon occurs 2-3 days after surgery.

Pain. Soreness in the area of intervention is absolutely natural, because every operation has an injury. For their prevention it should be taken the painkillers.

Other possible reactions. Raising the temperature to figures 37-37,3oC possible in most cases, it is the norm.

Conclusion. Thus, our analysis of literature data allows the operator to choose the on-line access to the periapical tissues in the presence of various risk factors, as well as reduce the risk of complications such as gum recession, declining interdental gingival papillae and the presence of scarring.

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